

I claim:

1. Apparatus for game playing, comprising:

an image generation machine capable of driving

a television, said image generation machine at least

5 in-part controlled by a controller for controlling electronic imagery, said controller comprising:

a housing structured to be held by two hands simultaneously, said housing having a left-hand area and right-hand area,

10 a four-way rocker located in said left-hand area of said housing,

a plurality of depressible buttons at least in-part exposed on said housing with the depressible buttons acting on

15 electricity manipulating devices contained within said housing and controlled by depression of said depressible buttons for manipulating electrical outputs at least useful for controlling electronic imagery; at least one of said electricity manipulating devices is a

20 pressure-sensitive variable-conductance sensor for defining an analog electrical output proportional to varying physical pressure applied to a depressible button of the plurality of depressible buttons, said button and said sensor are positioned in said right-hand area of said

25 housing;

means for outputting a signal from said controller to said image generation machine, said signal at least representational of said analog electrical output;

said sensor comprises:

30 circuit trace material supported by

a sheet, said sheet located within said housing,

a resilient dome cap positioned over said sheet and said circuit trace material, said resilient dome cap depressible by depressive pressure applied to said button.

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2. Apparatus for game playing in accordance with claim 1 wherein said resilient dome cap has an underside substantially convexed surface.

5 3. Apparatus for game playing in accordance with claim 2 wherein

said substantially convexed surface deformable to at least partially flatten-out with pressure applied to said button, the deforming of said substantially convexed surface causing electrical contact of additional surface area of the circuit trace material.

4. Apparatus for game playing in accordance with claim 3 wherein said circuit trace material is in an interdigitated form in an area under said resilient dome cap, and

15 said sheet is a circuit board.

5. Apparatus for game playing in accordance with claim 4 further including conductive material contacting the interdigitated circuit trace material when said button is depressed.

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6. Apparatus for game playing, comprising an image generation machine capable of driving an image display, said image generation machine at least in-part controlled by

25 a game controller structured to be held by a human user in two hands simultaneously, said controller comprising:

housing means for being held by the human user;

30 a plurality of depressible individual buttons exposed on said housing means and depressible by digits of the user's hands to operate

electricity manipulating devices contained within said housing means and operated for manipulating

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electrical outputs of said electricity manipulating devices by depression of said depressible individual buttons; at least one of said electricity manipulating devices including

5 means for an analog electrical output proportional to varying physical pressure applied by at least one depressible individual button of the plurality of depressible individual buttons;

means for outputting a signal from said controller to
10 said image generation machine, said signal at least representational of said analog electrical output.

7. Apparatus for game playing in accordance with claim 6 wherein said housing means is structured as a
15 single housing to be held by two hands simultaneously.

8. Apparatus for game playing in accordance with claim 7 wherein said means for an analog electrical output includes a resilient dome cap positioned over a first
20 circuit trace and a second circuit trace, the circuit traces are in close proximity to one another.

9. Apparatus for game playing in accordance with claim 8 further comprising
25 conductive material positioned to contact across the circuit traces when said resilient dome cap is depressed.

10. Apparatus for game playing in accordance with claim 9 wherein said resilient dome cap includes a substantially convexed portion positioned to press against
30 said conductive material when said resilient dome cap is depressed.

11. Apparatus for game playing in accordance with claim 10 wherein said convexed portion of said resilient dome cap is deformable when pressed against said
35 conductive material.

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12. Apparatus for game playing in accordance with claim 11 further comprising

5 a left hand area and a right hand area of said housing, and said one depressible individual button is position in said right hand area.

13. Apparatus for game playing in accordance with claim 12 further comprising

a four-way rocker at least in part exposed on said housing in said left hand area.

10 14. Apparatus for game playing in accordance with claim 13 further comprising

four analog sensors associated with said four-way rocker.

15 15. Apparatus for game playing in accordance with claim 14 further comprising

each sensor of said four analog sensors including a resilient dome cap.

16. Apparatus for game playing, comprising
20 a game console capable of controlling imagery shown by a television, said game console at least in-part controlled by

a controller, said controller comprising:

25 a housing to be grasped and held simultaneously by two hands of a human user; said housing including a right-hand area and a left-hand area, said right-hand area being an area for grasping by the user's right hand, said left-hand area being an area for grasping by the user's left hand;

30 a plurality of depressible individual buttons located on said housing in said right-hand area and positioned to be within reach of the user's right-hand thumb with the

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user's hand grasping said housing in said right-hand area;
 at least one button of said depressible individual
 buttons including means for defining an analog electrical
 output proportional to varying applied physical pressure;
 5 means for outputting from said controller to said
 game console a signal at least representational of said
 analog electrical output.

17. Apparatus for game playing in accordance with
 claim 16 wherein said means for defining an analog
 10 electrical output comprises:
 a resilient dome cap, said resilient dome cap
 positioned over
 conductive material, said conductive material
 positioned over
 15 circuit trace material.

18. Apparatus for game playing in accordance with
 claim 17 wherein said left-hand area includes a four-way
 rocker, said four-way rocker is associated with four
 electricity manipulating devices in part located on
 20 a circuit board, said circuit board continuing from
 said left-hand area into said right-hand area, said
 circuit board supporting said circuit trace material
 associated with said at least one button, said circuit
 trace material formed as interdigitated circuit traces,
 25 said resilient dome cap having a substantially convex
 shaped underside,

wherein a first level of pressure applied to said
 button causes said substantially convex shaped underside
 to contact said conductive material to a first surface
 30 area of said interdigitated circuit traces, and a second
 level of pressure applied to said button causes said
 convex shaped underside to contact said conductive
 material to a second surface area of said interdigitated
 circuit traces, said second level of pressure being

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greater than said first level of pressure and said second surface area being greater than said first surface area.

19. Apparatus for game playing in accordance with
5 claim 18 wherein said at least one button located in said right hand area is at least four buttons located in said right hand area.

20. Apparatus for game playing, comprising:
an image display for showing imagery;
10 an image generation machine capable of controlling imagery shown by said image display;
a game controller at least in part for controlling said image generation machine;
said game controller comprising:
15 a housing to be grasped and held simultaneously by two hands of a human user during use, said housing including a right-hand area and a left-hand area, said right-hand area being an area for grasping by the user's right hand, said left-hand area being an area for grasping
20 by the user's left hand;
a plurality of depressible electricity manipulating devices each at least in-part exposed on said housing, at least some of said plurality of electricity manipulating devices positioned on said housing to be within reach of
25 the user's right-hand thumb;
at least one device, of said electricity manipulating devices, includes means for creating an analog electrical signal representing varying applied physical pressure;
a resilient dome cap included in said at least one
30 device;
a substantially convexed shaped portion of said resilient dome cap;
conductive material positioned adjacent to said substantially convexed shaped portion of said resilient
35 dome cap;

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circuit trace material positioned adjacent to said conductive material; and,

at least one of said electricity manipulating devices includes means for creating an On/Off signal;

5 each of said electricity manipulating devices electrically connected to

electronics means for at least reading the signals of said electricity manipulating devices,

means for converting the signals into control of
10 imagery shown by said display, the signals representing at least the analog nature of said analog electrical signal, and the signals representing at least the On/Off nature of said On/Off signal.

21. Apparatus for game playing according to claim 20
15 wherein said at least one device, and said at least one of said electricity manipulating devices, are separate devices of said electricity manipulating devices.

22. Apparatus for game playing according to claim 20
20 wherein said at least one device, and said at least one of said electricity manipulating devices, is a single device of said electricity manipulating devices.

23. Apparatus for image control, comprising:
a machine for controlling imagery, said machine at least in-part controlled by

25 a hand held controller,
said controller comprising:

a housing shaped to be grasped and held simultaneously by two hands of a human user during use, said housing including a right-hand area and a left-hand
30 area;

a plurality of depressible electricity manipulating devices each at least in-part exposed on said housing,

at least one of said electricity manipulating devices

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a depressible resilient dome cap positioned over electrically conductive material, variable depression of said dome cap defining an analog electrical output representing said variable depression,

10 24. Apparatus for image control according to claim
23 wherein said conductive material is pressure-sensitive
variable-conductance material.

25. Apparatus for image control according to claim 23 wherein said depressible resilient dome cap has a substantially convexly rounded inner portion, said substantially convexly rounded inner portion comprising electrically conductive material.

26. Apparatus for image control according to claim
23 wherein said depressible resilient dome cap has a
20 substantially convexly rounded inner portion positioned
over
electrically conductive material.

27. Apparatus for image control according to claim
26 wherein said active electronics means includes an
25 integrated circuit chip.

28. Apparatus for image control according to claim 27 wherein said active electronics means includes a micro-controller.

29. Apparatus for image control according to claim
30 27 wherein said active electronics means includes an ASIC.

30. An electricity manipulating sensor for controlling electronic imagery, said sensor comprising;
a depressible surface area positioned to push
a depressible resilient dome cap to apply pressure to
5 electrically conductive material, said sensor for creating
analog output proportional to varying physical pressure
applied by the user's digit to said depressible surface;
said sensor electrically connected to
active electronics means for interpreting the analog
10 output of said sensor;
said sensor positioned as part of a two-hand held
controller, said controller for controlling imagery at
least in part in relation to the analog output.

31. An electricity manipulating sensor for a control
15 device according to claim 30 wherein within said
depressible resilient dome cap is a substantially convexed
shaped surface area to apply pressure to said electrically
conductive material.

32. An electricity manipulating sensor for a control
20 device according to claim 31 wherein said substantially
convexed shaped surface area has an apex, said surface
area is a rounded bulging area which is flexible, said
rounded bulging area increasingly flattens with increasing
pressure applied to said resilient dome cap.

33. An electricity manipulating sensor for a control
25 device according to claim 32 wherein the flattening of
said rounded bulging area causes additional surface area
contact of said electrically conductive material with
30 circuit trace material.

34. An electricity manipulating sensor for a control
device according to claim 33 wherein said circuit trace

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35. An electricity manipulating sensor for a control device according to claim 34 wherein said first circuit
5 trace and said second circuit trace are interdigitated.

37. An electricity manipulating sensor for a control device according to claim 36 wherein said housing is a single housing, and said depressible surface area is located to be depressed by a user's right-hand thumb.

39. Game apparatus comprising:

an image generation machine, said image generation
30 machine driving the game imagery, said image generation
machine at least in-part controlled by

a controller, said controller comprising:

a single housing to be grasped and held simultaneously by two hands of a human user, said housing including a right-hand area and a left-hand area;

5 a plurality of depressible electricity manipulating devices each at least in-part exposed on said housing;

at least one of said electricity manipulating devices including means for creating an On/Off output, and

10 at least one of said electricity manipulating devices including a pressure-sensitive variable-conductance means for creating a varying output related to varying pressure applied by a user's right-hand digit;

15 active electronics means for at least interpreting the outputs of said at least one electricity manipulating device.

40. Game apparatus according to claim 39 wherein said varying pressure is applied by the user's right-hand thumb.

20 41. Game apparatus according to claim 39 wherein said varying pressure is applied by the user's right-hand index finger.

42. Game apparatus according to claim 39 wherein a four-way rocker is located in said left-hand area.

25 43. Game apparatus according to claim 42 wherein said pressure-sensitive variable-conductance means includes means for establishing additional current paths, whereby electrical resistance is lowered according to pressure applied by the user's right-hand digit.

30 44. Game apparatus according to claim 43 wherein said pressure-sensitive variable-conductance means includes a deformable surface on an underside of a resilient dome cap.

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45. Game apparatus according to claim 44 wherein said varying pressure is applied by the user's right-hand thumb.

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46. Game apparatus according to claim 44 wherein
5 said varying pressure is applied by the user's right-hand index finger.

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47. Game apparatus according to claim 45 wherein said deformable surface includes an apex.

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